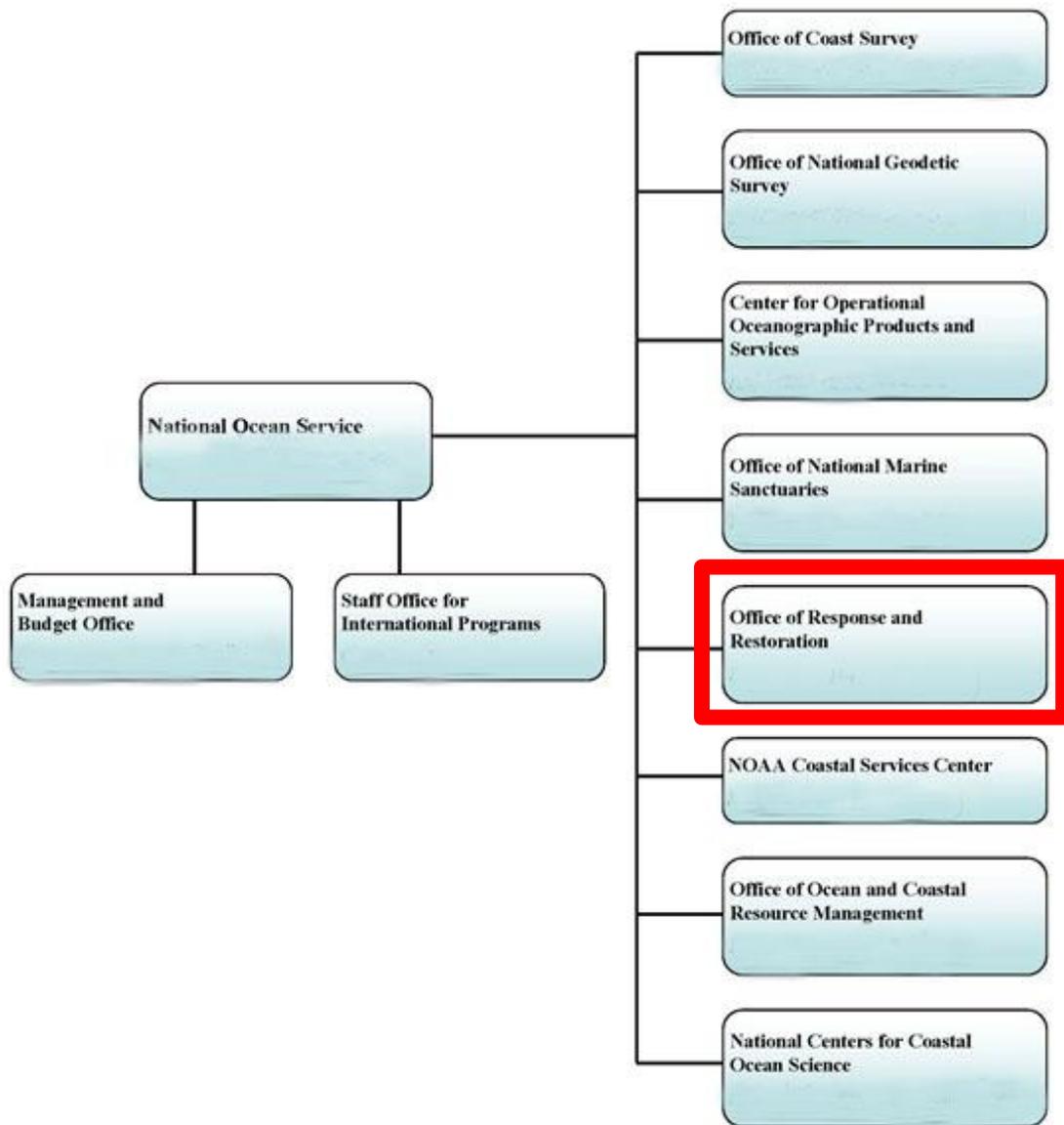


NOAA Science Advisory Board

July 17, 2012
Seattle War Room
Dave Westerholm, Director, OR&R





OR&R Divisions

Emergency
Response

Assessment and
Restoration

Marine Debris

Disaster Response
Center

Business Services

Who We Are

Four Divisions and One New Facility

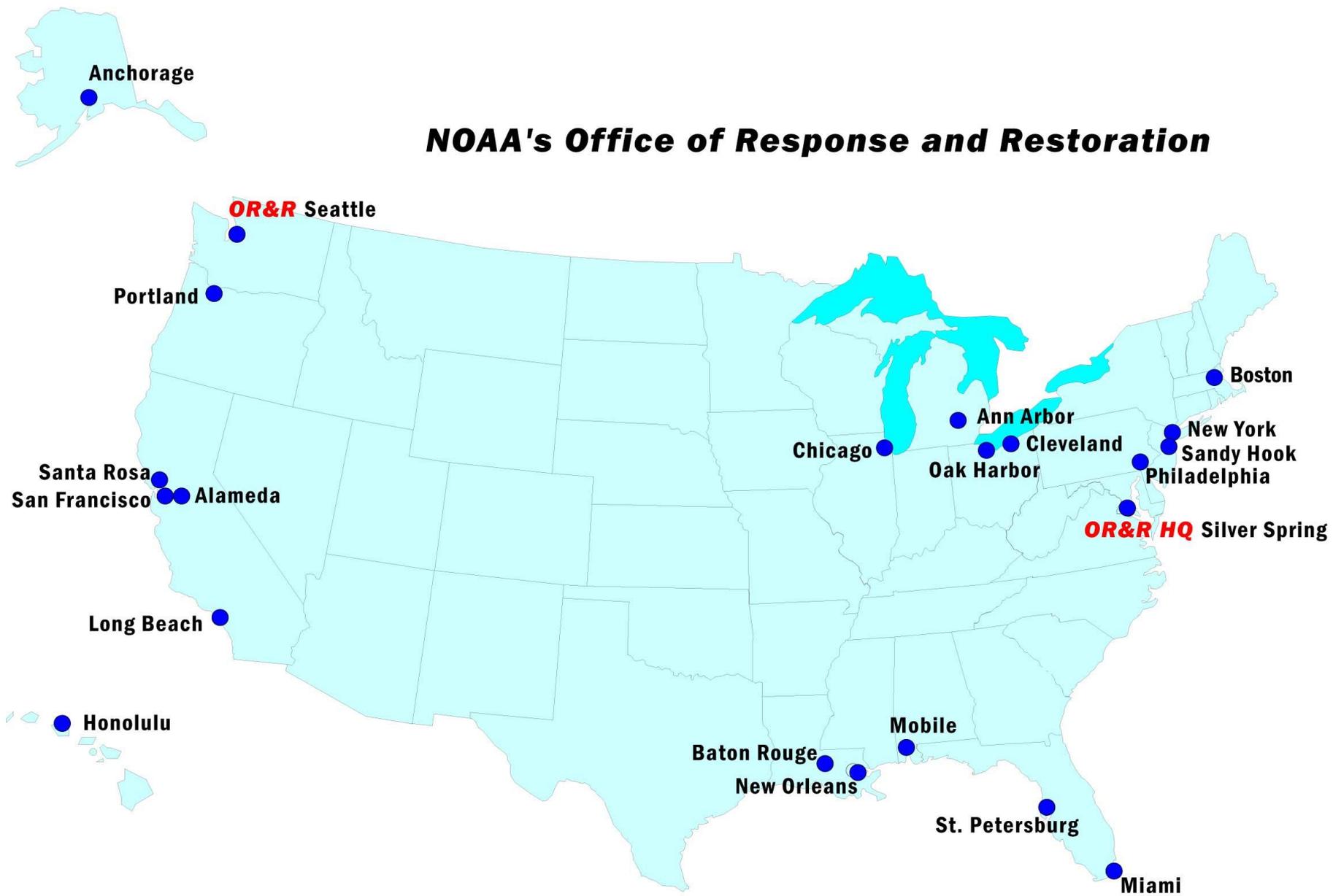
- Emergency Response
- Assessment and Restoration
- Marine Debris
- Business Services and Cost Recovery
- Disaster Response Center

What We Do

Many Areas of Expertise

- Science Support
- Research
- Trajectory Forecasts
- Grants
- Cost Documentation
- Spatial Data
- Modeling
- Outreach
- Economic Analysis

NOAA's Office of Response and Restoration



Our Mandates

OR&R supports some of the nation's strongest ocean protection laws:

Oil Pollution Act

CERCLA/Superfund

Marine Debris Research, Prevention and Reduction Act

Clean Water Act



This year, OR&R will:

- Respond to 120-170 oil spills
- Train over 700 emergency responders for oil spills
- Support over 40 oil spill drills with the U.S. Coast Guard
- Settle 4-7 natural resource damage assessment cases and continue work on over 200 additional cases.
- Support removal of hundreds of tons of marine debris
- Develop new tools & conduct research to address hazards on the water and prevent marine debris

Oil and Chemical Spills

Emergency Scientific Support

- Provide forecasts on fate and movement of pollutants
- Develop cleanup strategies, priorities and endpoints
- Conduct shoreline assessment and aerial observations
- Coordinate NOAA's resources (i.e. forecasts, fisheries)
- Characterize pollutant chemistry & environmental effects
- Identify and characterize resources at risk
- Train emergency responders
- Provide a common operational picture (ERMA™)

Oil and Chemical Spills

Upcoming Actions/Critical Issues

- Arctic Exploration and Caribbean deep well drilling
- BSEE regulations and E&P plan review
- Implementation of new NRT guidance including dispersants
- EPA's Subpart J
- 3-D Modeling

Restoring Injured Natural Resources

Damage Assessment, Remediation and Restoration Program

- Provide scientific expertise during cleanup to maximize protection and recovery of NOAA trust resources
- Conduct Natural Resource Damage Assessments (NRDA)
 - Assess and restore for impacts from spills, waste sites and groundings
 - Determine value of lost ecosystem services and human use
 - Implement and monitor restoration through NOAA's Restoration Center

Restoring Injured Natural Resources

Upcoming Actions/Critical Issues

- Deepwater Horizon settlement/ongoing negotiations

Key Products

- Habitat Equivalency Analysis; Natural Resource Economic Analyses
- Damage Assessment and Restoration Plans
- Spatial Data

Marine Debris Mitigation

Scientific Support and Products

- Federal lead for marine debris coordination (IMDCC- Interagency Marine Debris Coordinating Committee)
- Coordinate marine debris activities with partners including non-governmental organizations, State and local managers, federal partners, and the international community.
- Conduct microplastics and derelict fishing gear research
- Provide grants for research, removal and outreach
- Develop educational resources and materials

Marine Debris Mitigation

Upcoming Actions/Critical Issues

- Japan tsunami debris
- Reauthorization Bills in House and Senate

Key Initiatives

- International Strategy for addressing marine debris impacts
- Public outreach and education
- Fishing for Energy campaign
- Marine Debris Tracker

NOAA's Disaster Response Center

Mobile, Alabama

All-Hazards Support for the Gulf of Mexico

- Emergency Managers in the Gulf Region
- Deliver tailored products and services for preparedness, response and recovery applications
- Provide a state of the art facility for emergency operations, trainings, drills and workshops
- Identify and fill critical gaps in response capability and information requirements

Upcoming Actions/Critical Issues

- Dedication in Fall 2012
- Coordination of concept across NOAA under new CONOPs

New Challenges: Arctic

- Logistics of Working in the Arctic
- Oil in Ice Detection and Monitoring
- Models/Data for behavior/transport of oil in ice and under ice
- Oil Spill Clean Up Technologies:
- Cold weather response equipment
- Oil and ice
- Interacting with Stakeholders of the North Slope Communities
- Resources at Risk in the Arctic and data to make environmental response decisions

New Challenges: Subsurface

- Database of sunken vessels that contain oil (RUST, RULET, WORP)
- Effectiveness and consequences of subsea chemical dispersant operations
- Short and long-term fate/effects of subsurface oil including better understanding of biodegradation
- Well-blowout studies/models (including real time data and 3-D)

New Challenges: Marine Debris and Emergency Response

- Microplastics
- Derelict and Abandoned Vessels
- Long-term natural disaster marine debris issues
 - Japanese Tsunami Marine Debris
 - Katrina
- UXO's
- International Cooperation

Science for Emergency Response

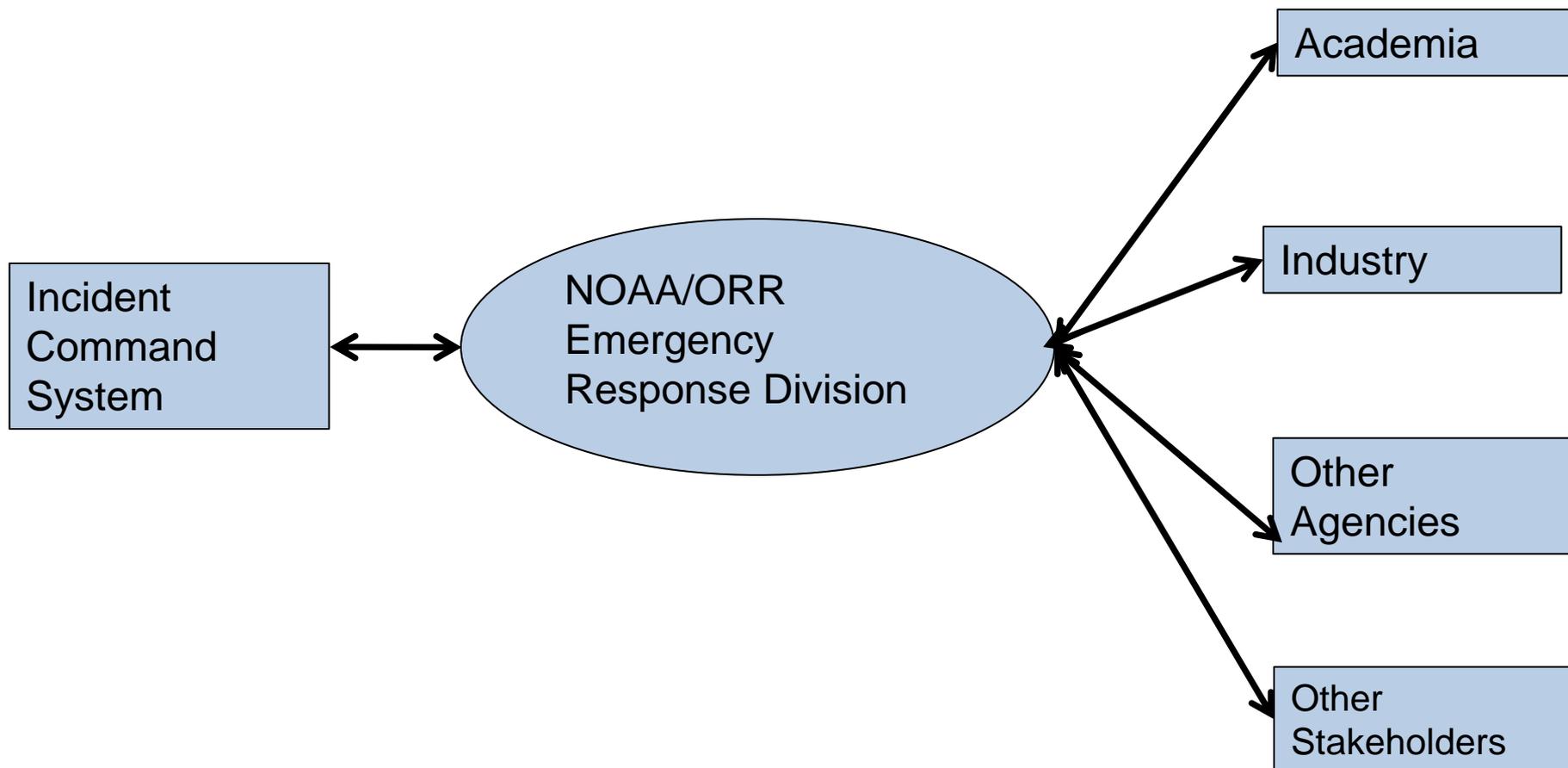


How We Operate



Time is of the essence.

How We Operate (con't.)



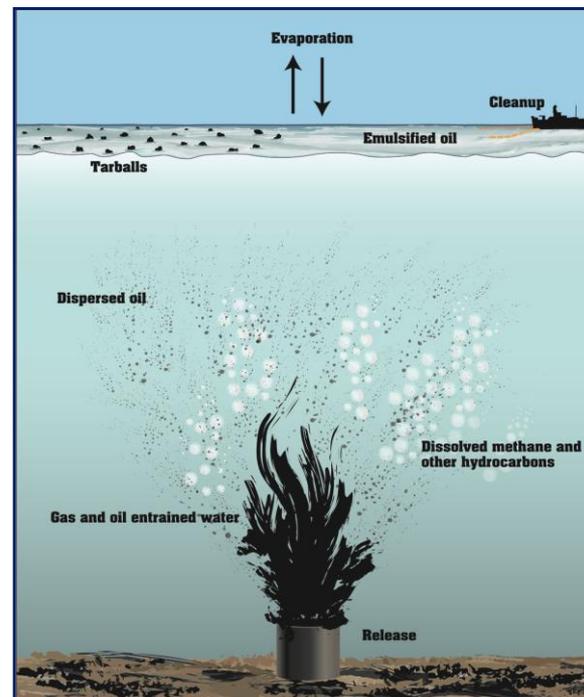
How We Operate (Example 1)

LEADS:

Lehr, Bill	National Oceanic and Atmospheric Administration (NOAA)
Bristol, Sky	U.S. Geological Survey (USGS)
Possolo, Antonio	National Institute of Standards and Technology (NIST)

MAJOR CONTRIBUTORS OR REVIEWERS: (See Appendix 9 for short biographies)

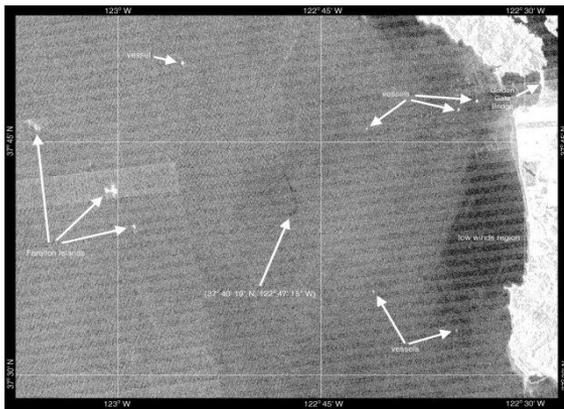
Expert	Affiliation	Major contribution
Allen, Alan	Spiltec	In-situ burning
Boufadel, Michel	Temple University	Review
Coolbaugh, Tom	ExxonMobil	Review
Daling, Per	SINTEF	Field data
Fingas, Merv	Environment Canada (retired)	Emulsion
French McCay, Debbie	Applied Science Associates (ASA)	Review
Goodman, Ron	Innovative Ventures Ltd.	Review
Jones, Robert	NOAA	Evaporation
Khelifa, Ali	Environment Canada	Dispersion
Lambert, Pat	Environment Canada	Review
Lee, Ken	Fisheries and Oceans Canada	Field data
Leifer, Ira	University of California Santa Barbara	Hydrates
Mearns, Alan	NOAA	Biodegradation
Overton, Ed	Louisiana State University	Dissolution
Payne, James	Payne Environmental Consultants	Review



Oil Budget Calculator



How We Operate (Example 2)

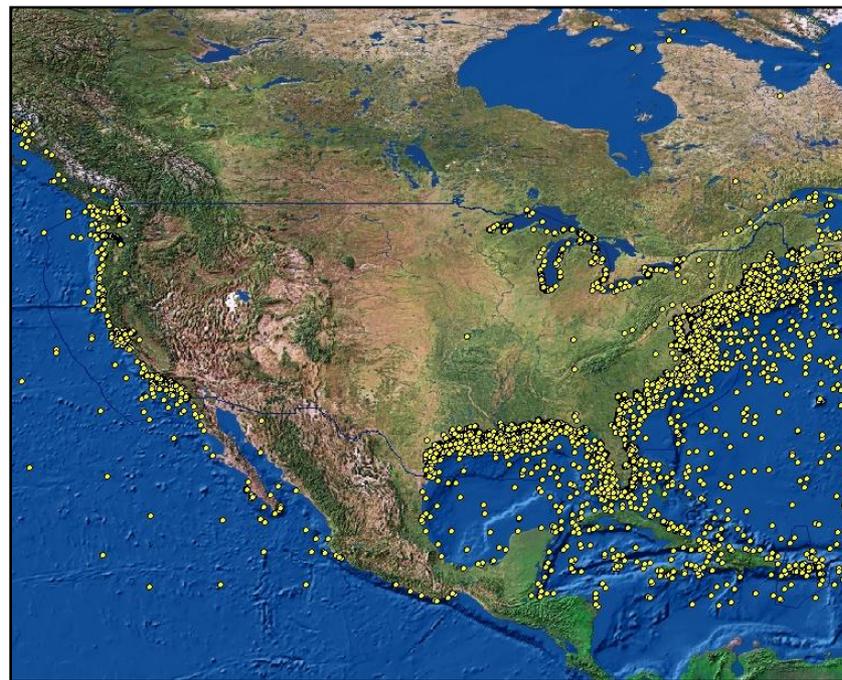


NESDIS/OR&R analysis of SAR



S.S. Jacob Luckenbach

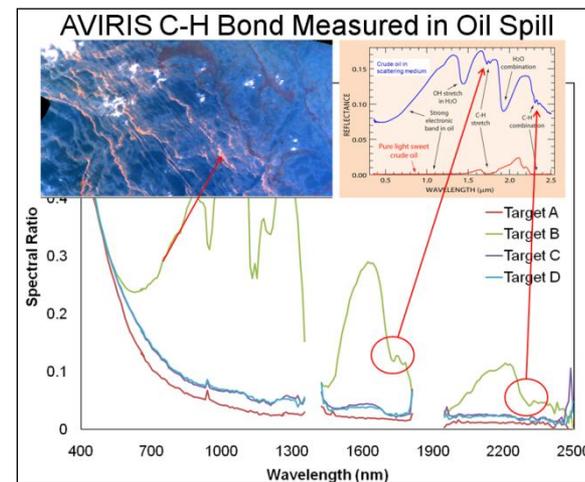
Sank on July 14, 1953 off San Francisco. Oil removed in 2003.



OR&R Scientists identify unmet scientific needs for spill response/mitigation.

Spill Threats Today

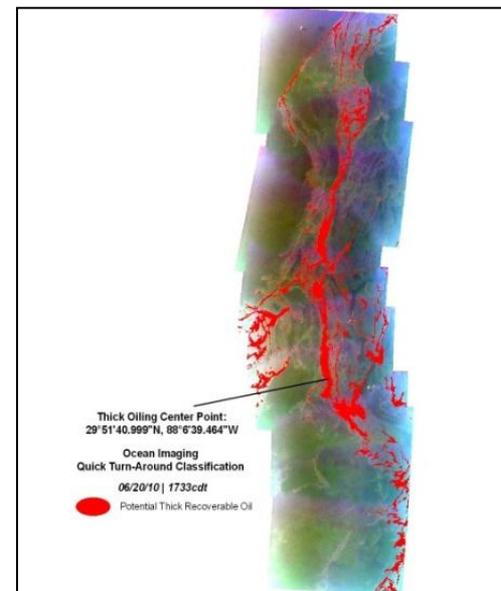
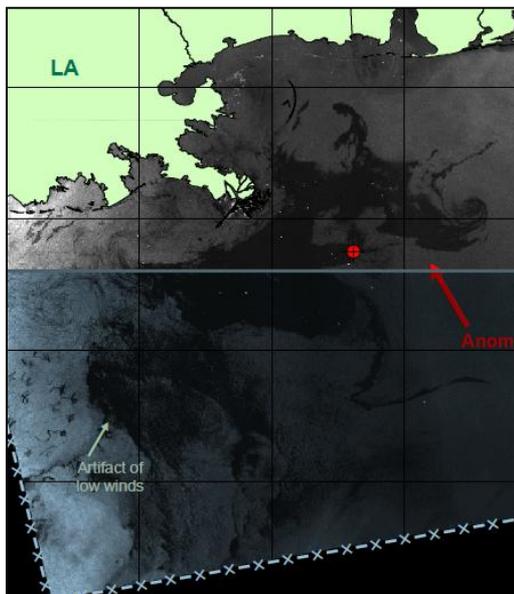
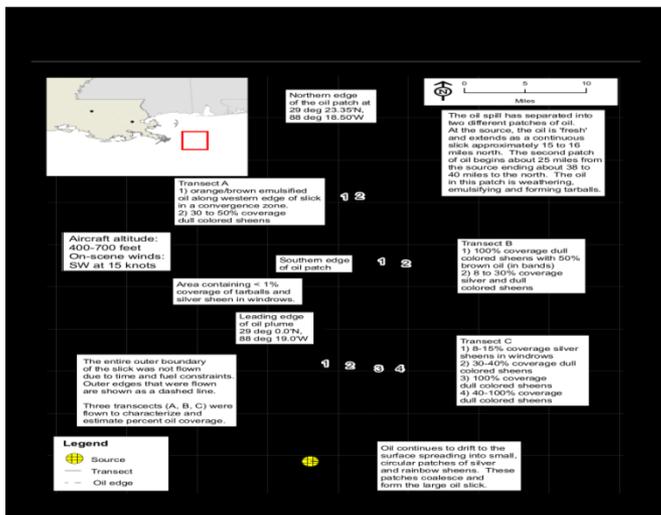
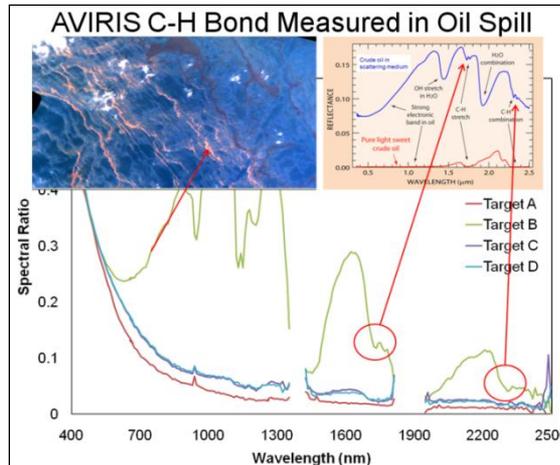
- New locations
- New tools
- New expectations



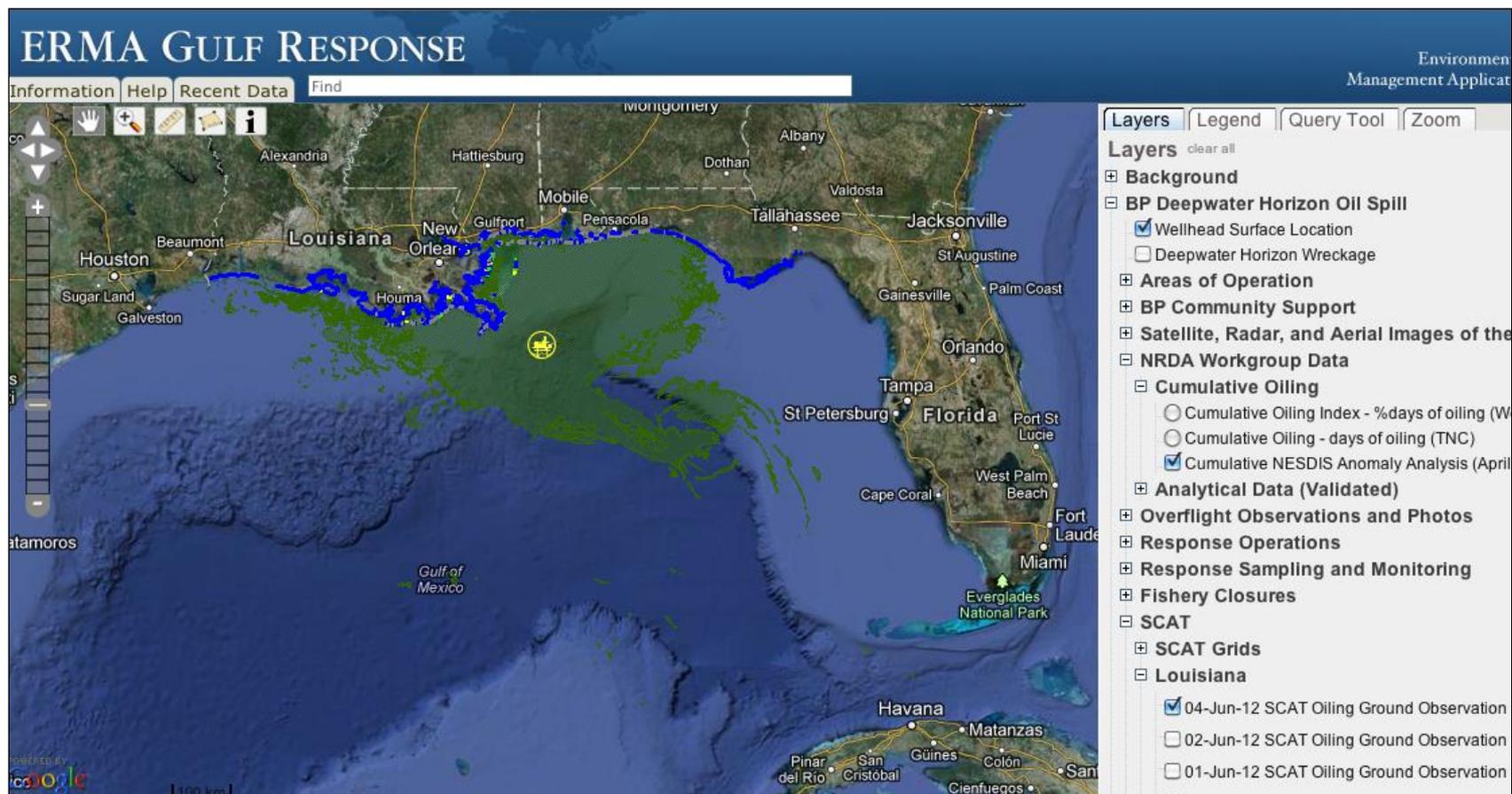
Key R&D Topics

- Dispersant decision procedures
- Biodegradation research
- Droplet size distribution studies
- Well–blowout models
- Environmental risk assessment

New Tools (remote sensing)



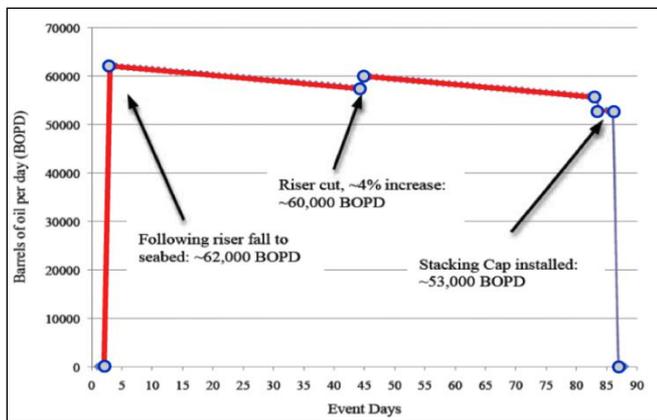
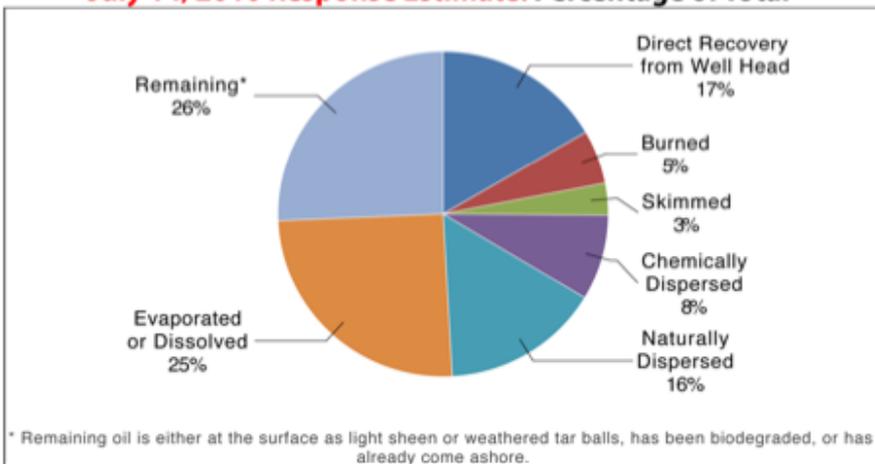
New Tools: ERMA



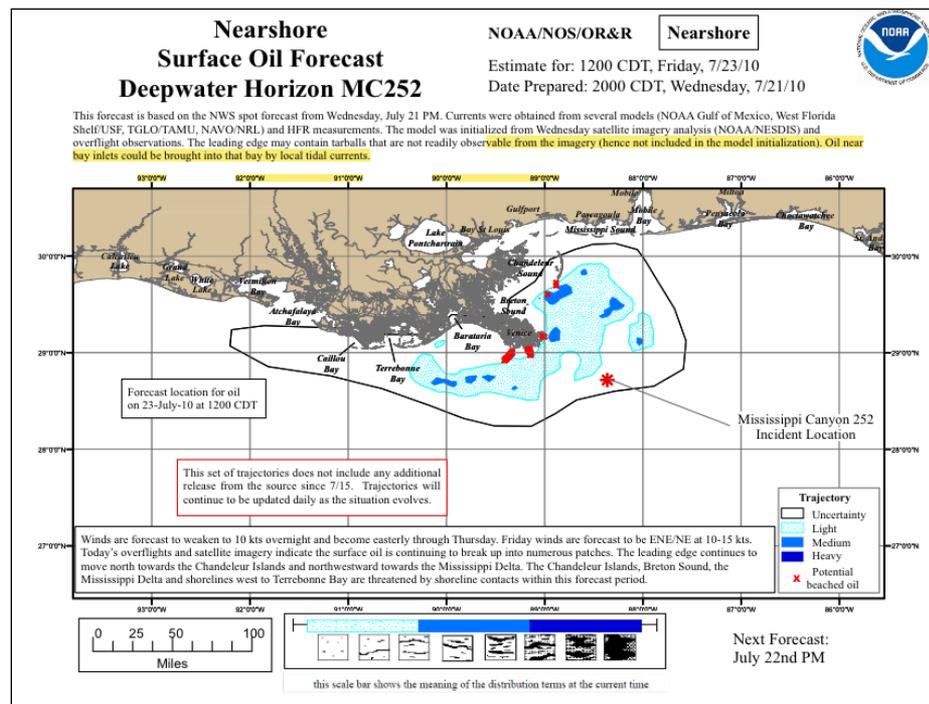
ERMA Gulf Response, powered by Environmental Response Management Application® (ERMA), is a web-based Geographic Information System (GIS) tool designed to assist both emergency responders and environmental resource managers who deal with incidents that may adversely impact the environment.

New Expectations

July 14, 2010 Response Estimate: Percentage of Total

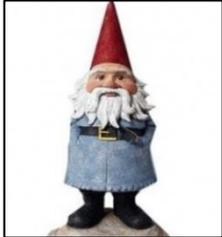
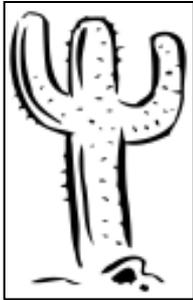


- Spill forecasts are no longer just for the on-scene command.



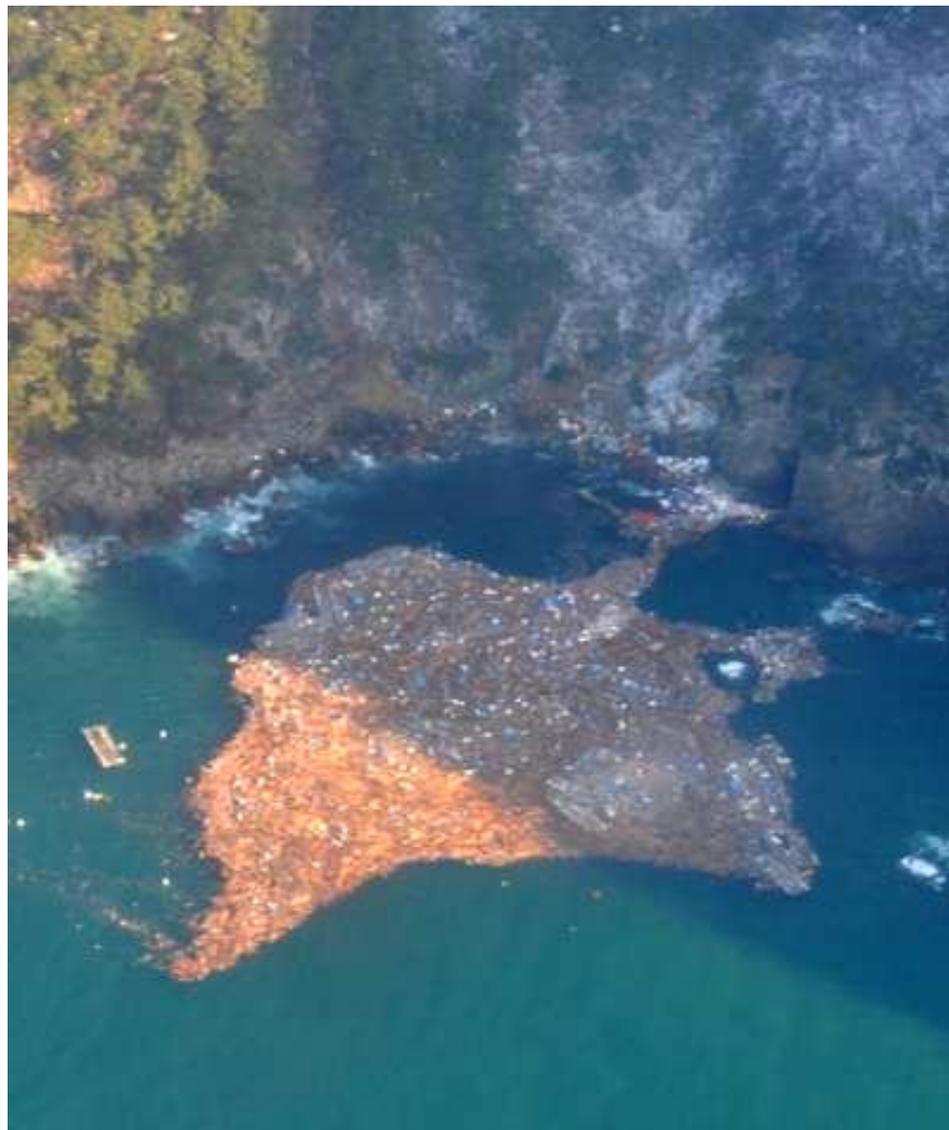
Next Generation Spill Models

GNOME 2 (oil trajectory model)

- 3-D Trajectory capability
 - Better ability to assimilate real-time data
 - New display products and ERMA export
- 
- Environmental risk assessment
 - Subsurface and longer-term processes
 - Greater user interactivity
- 
- Missing : Oil/ice interaction forecasting or tracking

Marine Debris Program

Japan Tsunami Marine Debris
Information, Action, and Science



Earthquake and Tsunami

- 9.0 magnitude earthquake
- Tsunami wave max. height: 130 ft.
- 217 square miles inundation
- 15,844 people confirmed dead, 3,451 missing
- Massive damage



Ofunato, March 15

Early Debris

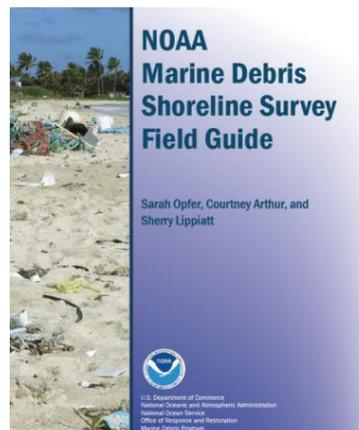
Debris on March 13 off the Sendai coast

- Patches and fields
- Wood, construction materials abundant
- The debris dispersed, some sunk



NOAA's Actions

- Safety first
- Modeling
- At-sea detection
- Sighting and reporting
- Shoreline survey
- Information and outreach



<http://marinedebris.noaa.gov/info/japanfaqs.html>

Collaboration with partners

- Other NOAA: OR&R ERD and ARD, NMS, NWS, NESDIS, OAR
- Other Feds: EPA, USCG, Navy, DOI, NASA, State
- States: CA, OR, WA, AK, HI
- Tribes: Makah, Quileute, Quinault, Shoelwater Bay
- Countries: Japan, Canada
- NGO: Coast Savers, Surfriders, SOS, HTB, Keepers
- Universities: OSU, UoW, UH, Kyoto U.

Safety First

- Radiation
- Maritime Advisory
- Guidelines for safe cleanup



Drifting vessel

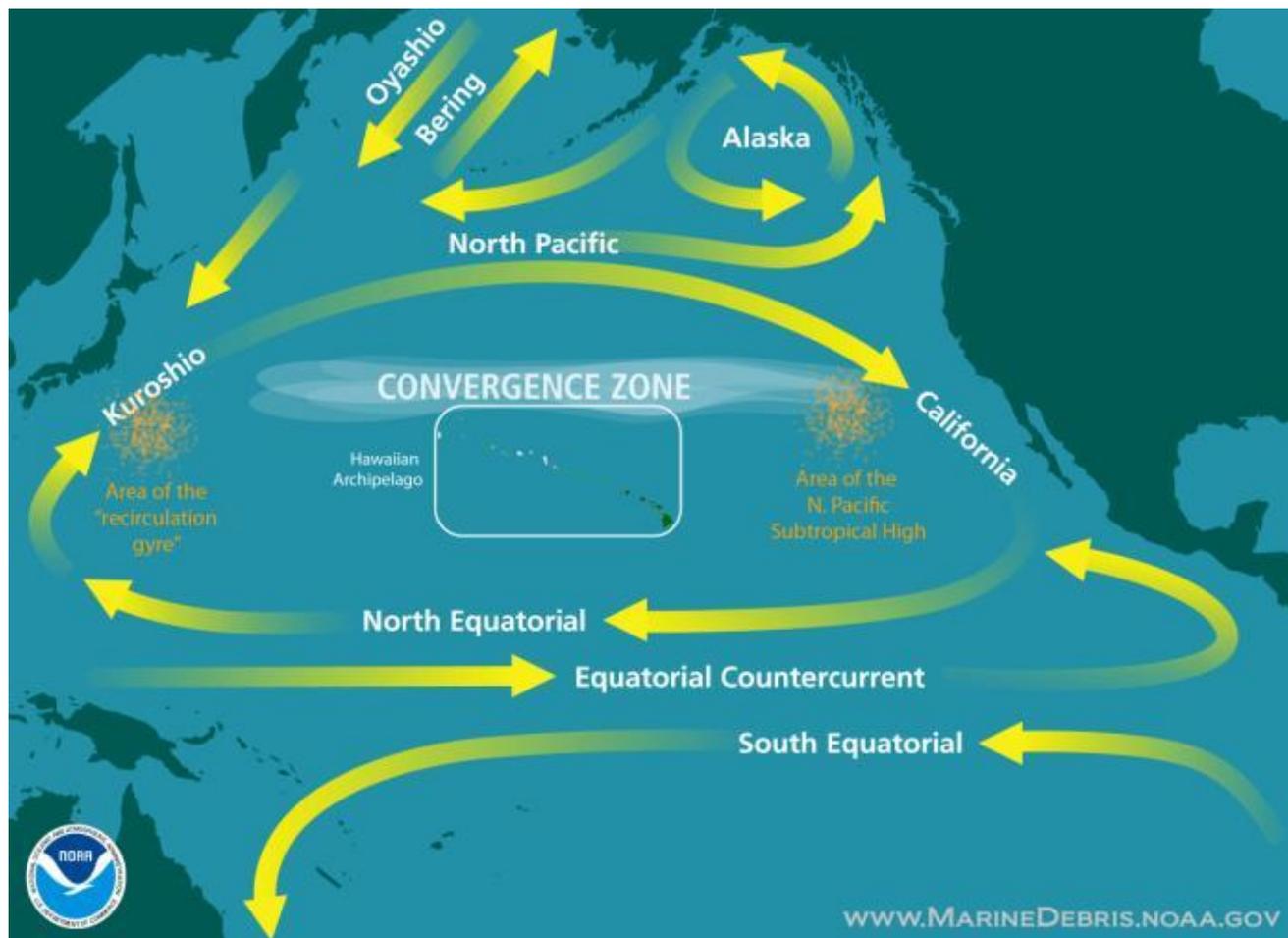


Syringe



Floating dock

Marine Debris Movement: Ocean Currents and Winds



Modeling: Updated Efforts

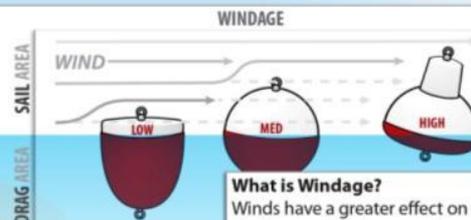
Modeled Movement of the Marine Debris Generated by the March 2011 Japan Tsunami



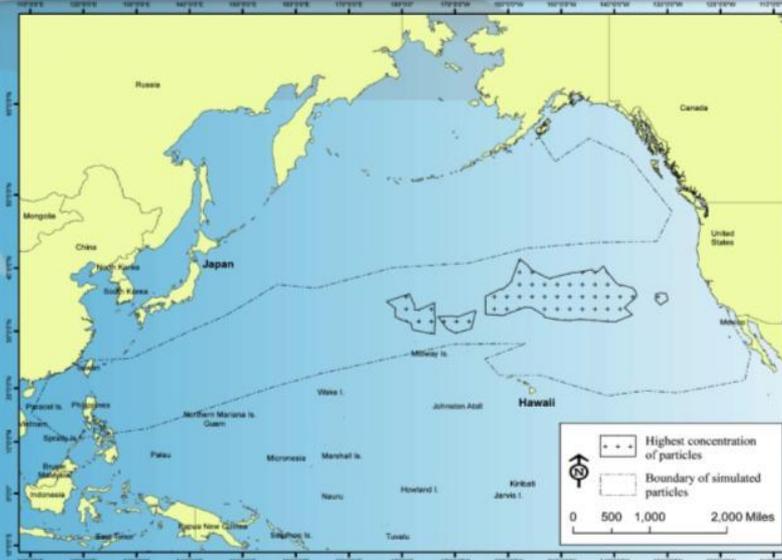
On March 11, 2011, an estimated 5 million tons of debris washed out by the tsunami

Estimated 30% floated away and dispersed

Estimated 70% sank near Japan



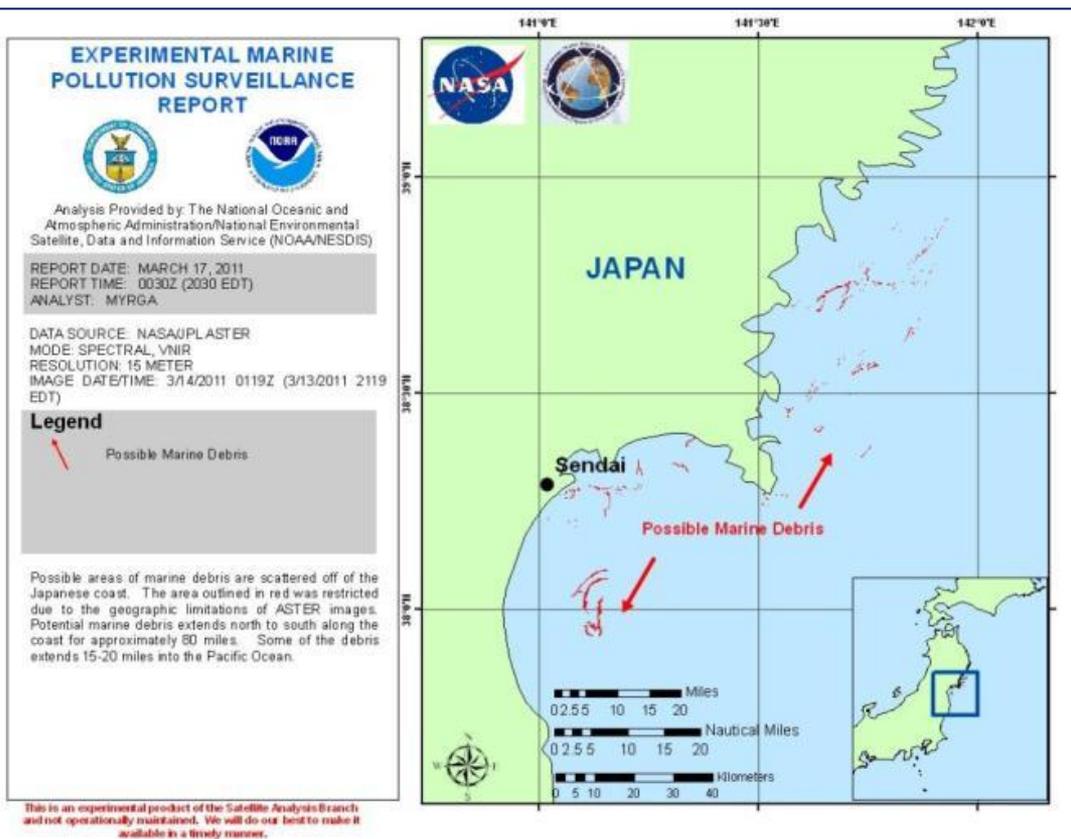
Expected Distribution of Computer Simulated Particles Through Wednesday, 05/30/12



- Japan Ministry of the Environment estimates that 5 million tons of debris washed into the ocean.
- They further estimated that 70% of that debris sank near the coast of Japan soon after the event.
- Model Results: High windage items may have reached the Pacific Northwest coast as early as winter 2011-2012.
- Majority of modeled particles are still dispersed north and east of the Hawaiian Archipelago.
- NOAA expects widely scattered debris may show up intermittently along shorelines for a long period of time, over the next year, or longer.

NOAA used a computer model to simulate the movement of tsunami debris from March 11, 2011, to the present day. This GNOME model (General NOAA Operational Modeling Environment) simulation is based on ocean surface currents from the US Navy (the Hybrid Coordinate Ocean Model) and winds from NOAA (the NOAA blended wind product). The computer model simultaneously released 1,000 simulated particles from each of 8 locations on the Japan coastline where tsunami wave heights were 3.5 meters or greater. Particles were randomly assigned windage values from 1-5%, meaning that they were moved not only by ocean currents, but were also moved by 1-5% of wind speed in the down-wind direction. The dotted black line contains 95% of all simulated particles. The cross-hatched area indicates the region of the highest concentration of simulated debris with 1% windage at the end of the simulation. For more details on this model, please visit marinedebris.noaa.gov. Have you seen tsunami debris? Report it to: DisasterDebris@noaa.gov

Satellite and Aerial Detection



At-sea Sightings



September 21, by the Russian vessel *Pallada*

Shoreline Sightings

- Marine debris is a persistent problem
- What is tsunami debris?
- Trends and traceable items



Soccer ball, March 2012



A float found in December 2011



Similar float found on April 1st 2011



Kerosene can, March 2012

Reporting Marine Debris

Report to:

Disasterdebris@noaa.gov

- Possibly tsunami related, **inert items** that are not hazardous or potentially hazardous
- Examples: Soccer ball, float



Report to:

National Response Center

1-800-424-8802

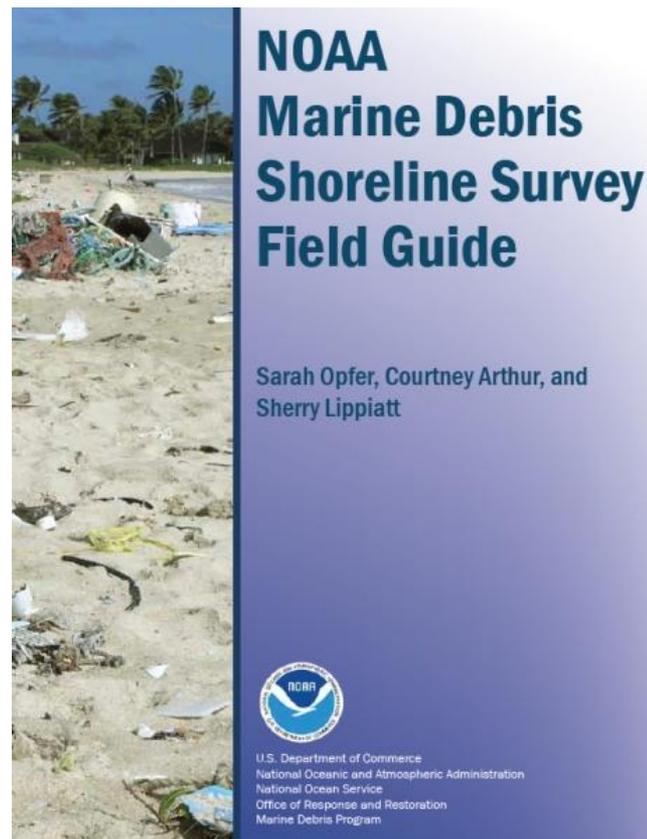
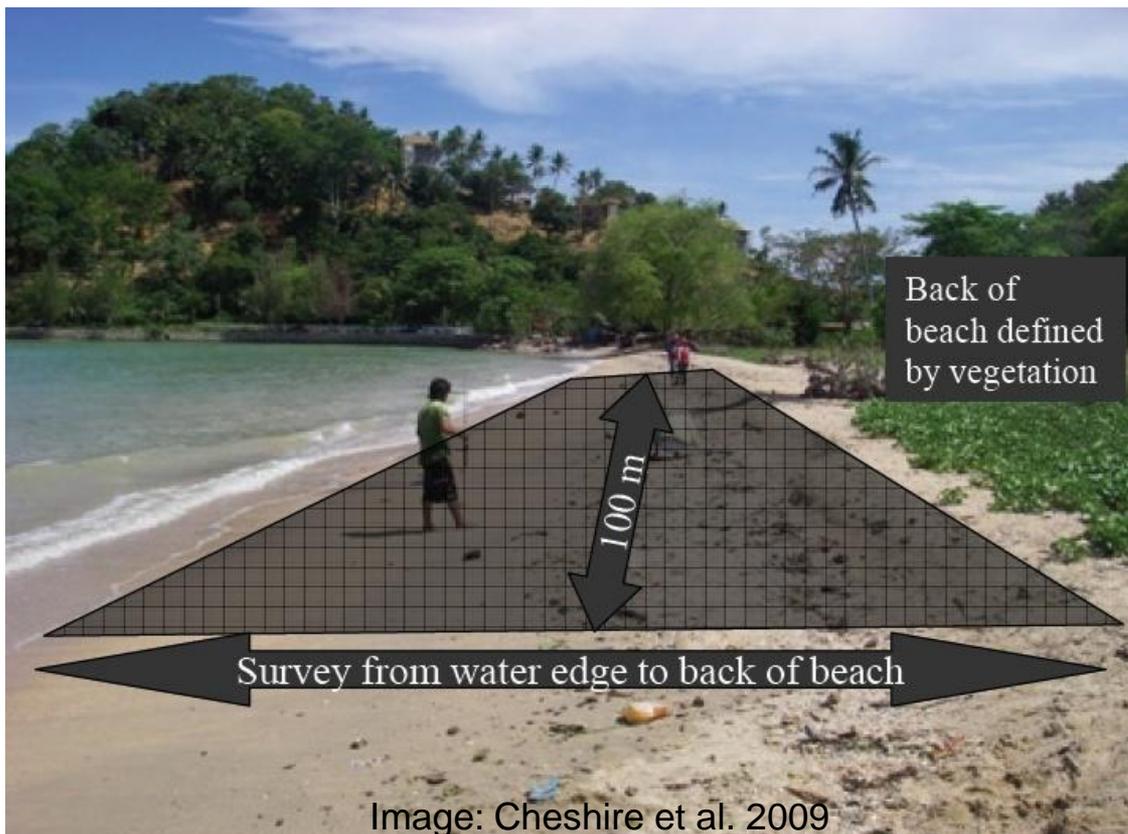
or call 911

- **Hazardous or potentially hazardous items**
- Examples: drums, chemical containers
Stay away! Don't open or remove item



Shoreline Monitoring MD.monitoring@noaa.gov

- Survey a defined stretch of shoreline on a regular basis
- Follow established protocols
- Record types and amounts of marine debris present

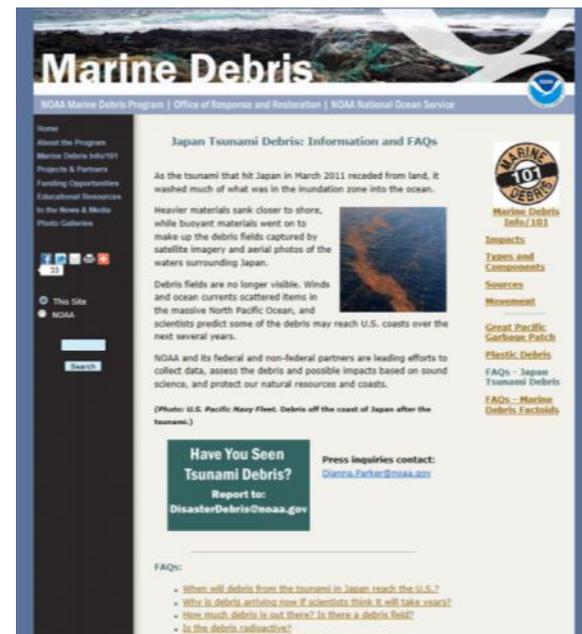


Tsunami Marine Debris: Detection, Sightings, Monitoring



Communication

- Media, digital, & social media
- Meetings & briefings with partners, stakeholders
- Public presentations
- Web page: <http://marinedebris.noaa.gov/info/japanfaq.html>
- Joint Information Center: <http://disasterdebris.wordpress.com>
- *Common portal for JTMD related materials across states / provinces / agencies*



Questions

Web: response.restoration.noaa.gov

Blog: usresponserestoration.wordpress.com

Incident News: <http://incidentnews.gov/>

MDP: <http://marinedebris.noaa.gov/>

Report debris sightings: disasterdebris@noaa.gov

DARRP: <http://www.darrp.noaa.gov/>

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